REMARKS

Claims 1-4, 11-15, 17, 18 and 29 are currently pending. Claims 1-4, 11-15, 17, 18 and 29 are rejected as follows: (i) claim 2 is rejected under 35 U.S.C. §112, first paragraph; (ii) claim 2 is rejected under 35 U.S.C. §112, second paragraph; (iii) claim 29 is rejected under 35, U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,471,924 to Feeley *et al.* ("Feeley"); (iv) claims 1-4, 13 and 17-18 are rejected under 35 U.S.C. §102(b) as being anticipated by EP 723,805 ("EP '805"); (v) claims 1-2, 11, 12 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP 666,099 ("EP '099") in view of EP '805; and (vi) claims 14 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP '099 in view of EP '805 and further in view of Japanese Publication No. 2000157870 ("JPN '870) or Feeley. In view of the remarks presented herein, the applicant respectfully traverses these rejections as set forth below.

Response to Rejection of Claim 2 Under 35 U.S.C. §112, First Paragraph

Claim 2 is rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Office Action states that the use of the term "vanadia" is not supported in the specification.

Under 35 U.S.C. §112, an applicant is required to convey to one skilled in the art, possession of the invention. In this case, the Examiner rejects the previous amendment to claim 2, in which the applicant amended the term "vanadium" to "vanadia." Section 112 does not require the language used in the claim be an exact replication of terminology used in the specification. It is only necessary to show that one skilled in the art would appreciate the features in the possession of the applicant (*see e.g. In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (C.C.P.A. 1977)). In this case, in view of the specification and the inventive field, one skilled in the art would appreciate the use of the term "vanadia" as presently claimed. As stated in applicant's amendment filed with the Office on November 3, 2006:

> A person of ordinary skill would understand that in a ***solid acid*** system there would be a vanadium oxide (*i.e.*, "vanadia") instead of elemental

> vanadium, in combination with titanium dioxide (*i.e.*, the person of ordinary skill would recognize that a "vanadia/titania" catalyst was claimed, not a titania catalyst with elemental vanadium).

(Applicant's Nov. 3, 2006 Amendment, p. 6). The applicant's proper use of the disputed term is supported by the specification and further evidenced by one of the oldest and most extensive patents on SCR-catalysts based on solid acids, U.S. Patent No. 4,085,193 to Nakajima *et al.* ("Nakajima"). Nakajima describes different combinations of titania, vanadia and other components under headings denoted by the element symbol V, for vanadium. For example, the following headings are found in Nakajima:

IV. Ti-V type catalysts
X. Ti-W-V type catalysts
XIV. Ti-V-Mo type catalysts
XV. Ti-V-Fe type catalysts
XVI. Ti-W-Mo-V type catalysts
XVII. Ti-V-Sn type catalysts
XVIII. Ti-Mo-V-Sn type catalysts
XIX. Ti-W-V-Sn type catalysts

Again, while the metals are used to designate the catalyst, it is clear from the subject matter of the patent that it is in fact the oxides that are intended. Other examples of the use of vanadium in this context include:

1. DE 198 06 266 C1 and U.S. counterpart U.S. Patent No. 6,641,785 to Neufert *et al.* ("Neufert"). The German patent explicitly describes the "Feststoffsäure-System" (solid acid system) $TiO_2/WO_3/MoO_3/V_2O_5/CaO/SiO_2$ in the abstract and elsewhere. Similarly, the solid acid system of Neufert also describes the requisite oxide combinations in the abstract and throughout the patent. (Addendum 1).

2. Excerpt from the book "Catalytic Air Pollution Control" of R. M. Heck and R. J. Farrauto from 1995. Applicant has marked the occurrences of V_2O_5/TiO_2. Additionally, on page 170, only the metals vanadium and titanium are mentioned (*see* table 10.1) while it is clear that the oxides are intended. (Addendum 2).

Therefore, while the term "vanadia" is not literally recited in the applicant's specification, it is clear that one of ordinary skill would understand the intended elemental form when the specification is considered in its entirety and further in view of the inventive field. Accordingly, the applicant respectfully requests the rejection of claim 2 under 35 U.S.C. §112, first paragraph, be reconsidered and withdrawn.

Response to Rejection of Claim 2 Under 35 U.S.C. §112, Second Paragraph

Claim 2 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states that the use of the term "vanadia" is indefinite and inaccurate. Again, the applicant respectfully disagrees with this assertion. In view of the specification, one skilled in the art would appreciate the specificity to which the claims identify the nature of the invention. Furthermore, in view of the aforementioned support for what is commonly understood by one skilled in the art, the applicant contends that the term "vanadia" is neither indefinite nor inaccurate. Accordingly, the applicant respectfully requests the rejection of claim 2 under 35 U.S.C. §112, second paragraph, be reconsidered and withdrawn.

Response to Rejection of Claim 2 Under 35 U.S.C. §102(e)

Claim 29 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,471,924 to Feeley et al. ("Feeley"). Anticipation requires that a single reference disclose each and every element of a claimed invention. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984). As viewed by a person of ordinary skill in the art, there must be no difference between the cited reference and the claimed invention. *Scripps Clinic & Res. Found. v. Genentec, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). Further, anticipation requires that the cited reference disclose each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.3d 1452, 1458 (Fed. Cir. 1984).

The Office refers to Fig. 2 of Feeley as teaching each and every element of claim

29. In the rejection, the Office Action states:

> Feeley et al. '924 discloses an exhaust gas treatment unit (Figure 2) for the selective catalytic reduction of nitrogen oxides under lean exhaust gas conditions, comprising (a) an oxidation catalyst (30) for oxidizing nitrogen monoxide in exhaust gas to nitrogen dioxide; and, (b) downstream of the oxidation catalyst a single catalyst member comprising a honeycomb support (Col. 4, lines 37-42) and a first layer (20a) and a second layer (20b), wherein (i) the first layer (20a) contacts the honeycomb support and comprises one or more storage components for storing nitrogen oxides as nitrates, wherein the one or more storage components consist essentially of one or more compounds of an element selected from the group consisting of an alkali metal, an alkaline earth metal, and cerium; (Col. 10, lines 1-34) and (ii) wherein the second layer is in contact with exhaust gas and comprises a catalytically active component for selective catalytic reduction of nitrogen oxide. (Col 7, lines 34-45, Col 8, lines 11-37, and col. 10-Col 11).

The applicant respectfully disagrees with this interpretation of Feeley and submits that Feeley does not describe the subject matter represented in claim 29 of the present application. For example, Fig. 2, reference numeral (30), as cited by the Office represents a "NOx trap canister" (*see* col. 8, line 16). The catalyst in the NOx trap canister is described in col. 6, line 40 to col. 7, line 53. That catalyst comprises an oxidation catalyst and a NOx sorbent material. These two components may be arranged in one single layer 20 or may be arranged in a double layer 20a/20b (*see* col. 7, lines 34-53). In contrast, the present application describes a simple oxidation catalyst, different from the combination of oxidation catalyst with NOx sorbent material required for the functioning of Feeley (*see* col. 6, lines 40-53, describing the necessity of the combination of the oxidation catalyst with the NOx sorbent material on the NOx trap member). Further, the lean NOx abatement catalyst of Feeley, Fig. 2, reference numeral (34), also fails to read on each and every element of the claim. For example, nothing in the extensive description of the lean NOx abatement catalyst (*see* col. 11, lines 8-52) suggests the combination of the catalyst with a second layer comprising a NOx sorbent as presently claimed.

Again, the exhaust gas cleaning apparatus described in Feeley, comprising NOx trap canister comprising a combination of an oxidation catalyst with a NOx sorbent

material, followed by a lean NOx abatement catalyst further comprising a catalyst to catalyze the reduction of NOx in the presence of a suitable reductant, is not the same as the unit of the present application. In contrast to Feeley, the present application describes an exhaust gas treatment unit comprising a simple oxidation catalyst and downstream thereof a catalyst for lean NOx reduction comprising two layers with different catalytic functions. The first layer on the catalyst carrier comprises NOx storage components and the second layer laying on the first layer comprises catalytically active components for selective catalytic reduction of nitrogen oxide. Thus, in view of at least the aforementioned distinctions, it is clear that Feeley does not anticipate the present unit. Accordingly, the applicant respectfully requests that the rejection of claim 29 under 35 U.S.C. §102(e) be reconsidered and withdrawn.

Response to Rejection of Claims 1-4, 13 and 17-18 Under 35 U.S.C. §102(b)

Claims 1-4, 13 and 17-18 are rejected under 35 U.S.C. §102(b) as being anticipated by EP 723,805 ("EP '805"). EP '805 discloses several exhaust gas treatment apparatuses comprising varying catalysts. For example, the embodiments in Fig. 1, Fig. 2, Fig. 3 and Fig. 7 all use as a first catalyst a three-way reducing and oxidizing catalyst. Although this catalyst functions as an oxidation catalyst when the exhaust gas is lean, it is not the same as the oxidation catalyst set forth in the present application. The following discussion sets forth exemplary distinctions between EP '805 and the claims of the present application.

Embodiment according to Fig. 1 of EP '805

Regarding the embodiment in Fig. 1, a NH_3 decomposing catalyst (7) is arranged downstream of the oxidation catalyst (3). The composition of this NH_3 decomposing catalyst is discussed on page 7, lines 30 to 42, on page 8, lines 27 to 37, and on page 10, lines 1 to 17. The claims of the present application provide the selection of a component; the composition of the component may come near to the composition of the SCR components, which are employed in the present application (*see* page 3, lines 9-19 of

applicant's specification). However, the present claims do not suggest that the SCR components should be combined with NOx storage components as offered in EP '805. Further, with regard to the SCR components, EP '805 suggests that conventional denitrating catalysts, such as vanadia-titania type catalysts, are not suitable as NH_3 decomposing catalysts for the invention of EP '805. Therefore, the cited reference fails to teach the claims of the present application. Furthermore, in view of EP '805, one skilled in the art would be led away from the downstream catalyst as presently claimed.

Embodiment according to Fig. 2 of EP '805

Regarding the embodiment in Fig. 2, a NOx storage catalyst is arranged downstream of the NH_3 decomposing catalyst. The NOx storage catalysts of EP '805 comprise platinum group metals and alkali metals, alkali-earth metals or rare-earth metals. (*see e.g.,* page 12, lines 35-45). For the catalyst to function, it is clear that the platinum group metals are an obligatory component of this catalyst (*see e.g.,* page 12, line 46 to page 13, line 9), without which, there would be no oxidation of NO to NO_2 (*see e.g.*, page 12, line 55 for exemplary equation).

Additionally, it is apparent that the NOx storage components of catalyst (8) of the embodiment of the reference are not combined with the SCR components as in the applicant's present claims. Instead, the NOx storage components of catalyst (8) are inevitably combined with platinum group metals. Thus, even if a person skilled in the art would try to combine the NH_3 decomposing catalyst (7) with the NOx storage catalyst (8), he would still not arrive at the claims of the present application.

Further, when alleging that the NOx storage components comprise no catalytically active platinum group metals, the Office improperly equates the NOx storage catalyst to the NH_3 decomposing catalyst when it cites to EP '805, page 7, lines 1 to 35. This section of EP '805 describes the NH_3 decomposing catalyst and not the NOx storage catalyst as offered by the Office. EP '805 is clear when describing the composition of the individual catalysts that these descriptions should not be mixed up.

Embodiment according to Fig. 3 of EP '805

The embodiment in Fig. 3 is similar to that of Fig. 1. with the exception of the number of the NH_3 catalysts present (Fig. 3 offers three NH_3 decomposing catalysts arranged in sequence, instead of only one as presented in the embodiment of Fig. 1). Therefore, many of the remarks regarding Fig. 1 are also applicable in distinguishing Fig. 3 from the claims of the present application.

Regarding the catalytic components, EP '805 provides that the catalytic components used for the NH_3 decomposing catalysts may be the same for all the NH_3 decomposing catalysts, or in the alternative, different components for different NH_3 decomposing catalysts may be used (*see* page 14, lines 43-45). However, although "different components" may be used, they can only be selected from the components already given in the references cited for the embodiment of Fig. 1. Therefore, in view of this limitation, as well as the remarks regarding Fig. 1, Fig. 3 also fails to teach the elements as presently claimed.

Embodiment according to Fig. 7 of EP '805

The embodiment in Fig. 7 is similar to that of Fig. 2 because the NOx storage catalyst (8) of the embodiment of Fig. 2 is arranged between the oxidation catalyst (3) and the NH_3 decomposing catalyst (7). Accordingly, the same arguments offered above regarding the embodiment of Fig. 2 are applicable to Fig. 7 as well.

Again, the applicant respectfully disagrees with the Office's rejection of independent claim 1 of the present application, as well as all claims depending therefrom, in view of EP '805. Accordingly, the applicant respectfully requests the rejection of claims 1-4, 13 and 17-18 under 35 U.S.C. §102(b) be reconsidered and withdrawn.

Response to Rejection of Claims 1-2, 11, 12 and 13 Under 35 U.S.C. §103(a)

Claims 1-2, 11, 12 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP 666,099 ("EP '099") in view of EP '805. The teachings of more than one reference may be considered in combination provided one of ordinary skill in

the art would combine the references in that way to solve the problem facing the inventor. *KSR International Co. v. Teleflex Inc.* 127 S. Ct. 1727, 1734 (April 30, 2007). Furthermore, the combination of the references should teach each element claimed in the pending application. The applicant respectfully submits that the cited prior art does not render the present claims obvious, as one of ordinary skill in the art would not combine the references in the manner that the Examiner applies them and the combination fails to teach every element as required.

The Office contends that the teachings of EP '099 in combination with the teachings of EP '805 render the present claims obvious, however, the applicant respectfully disagrees. EP '099 describes a method of removing nitrogen oxides contained in exhaust gas. For this method a special nitrogen oxide storage catalyst is used that comprises at least one noble metal selected from the platinum group and storage materials. In asserting the relevance of the combination of EP '099 and EP '805, the Office cites to page 7, lines 1 to 35 of EP '805 as teaching the "selection for the NOx storage/decomposition catalyst" (Office Action, p. 7). As previously discussed, the Office's characterization of the NOx storage is improper. The distinction between the NOx storage catalyst and the NH_3 decomposing catalyst is significant and therefore should not be disregarded in the manner suggested by the Office. For at least the reason of the Office's mischaracterization of the NOx, one skilled in the art would not seek to combine the references as offered by the Office. However, even if the references were improperly combined, still the combination would not reach the required threshold of obviousness. In this case, because neither reference teaches the use of storage materials such as alkali metals or alkaline earth metals in the absence of platinum group metals, the combination of the references similarly fails to teach at least this element.

Therefore, because one skilled in the art would not have combined the references and further because the references, independently and in combination, fail to teach every element of claim 1, the rejection of claim 1 as well as all claims depending therefrom is improper. Accordingly, the applicant respectfully requests the rejection of the claims under 35 U.S.C. §103(a) be reconsidered and withdrawn.

Response to Rejection of Claims 14 and 15 Under 35 U.S.C. §103(a)

Claims 14 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP '099 in view of EP '805 and further in view of Japanese Publication No. 2000157870 ("JPN '870) or Feeley. Japanese Publication No. 2000157870 (corresponding U.S. Patent No. 6,677,264 B1 to Klein *et al.*) discloses a catalyst for the cleaning of the exhaust gases of a diesel engine comprising two functional layers. The first functional layer lying directly on the catalyst carrier body and comprises nitrogen oxide storage compounds and the second functional layer lying on to of the first functional layer and comprises zeolites functioning as hydrocarbon storage materials and platinum group metals on acidic support materials. This composition of the catalyst does not structurally read on the downstream catalyst of the present application. As presently claimed, the downstream catalyst does not contain catalytically active noble metals from the platinum group. Therefore, for at least this reason, there is a deficiency in the teaching of JPN '870 with regard to claims 14 and 15. Furthermore, the deficiency is not adequately cured by the teachings of Feeley, or the prior cited references (EP '099 and EP '805). Accordingly, for at least the foregoing reasons, the applicant kindly request the rejection of dependent claims 14 and 15 under 35 U.S.C. §103(a) be reconsidered and withdrawn.

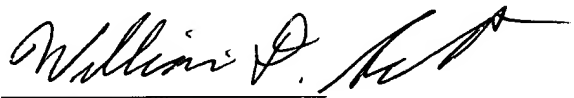
CONCLUSION

In view of the remarks presented herein, the applicant believes that all claims presented in the present application are allowable over the cited prior art and respectfully requests a notice of allowance to this effect.

No fee other than the enclosed fee for a three-month extension of time is believed to be due with respect to the filing of this Response. If any further fees are deemed due, or an overpayment has been made, please charge, or credit, Deposit Account No. 11-0171 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicant's attorney at the telephone number provided below.

Respectfully submitted,



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